

1 A. **TITLE OF THE INVENTION**

2 Travel Case for Transporting Insulin

3 B. **CROSS-REFERENCE TO RELATED APPLICATIONS**

4 Not Applicable

5 C. **STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH/DEVELOPMENT**

6 The present invention does not involve any form of federally sponsored research or
7 development.

8 D. **BACKGROUND OF THE INVENTION**

9 The present invention relates generally to a container for transporting medicines requiring
10 cold storage, and more specifically to a container used to transport insulin. Containers utilizing heat
11 sinks are well known in the art, but are generally adapted for industrial use and not suitable for
12 individual consumers, or at least not convenient for consumers.

13 One species of insulating carrying devices contains heat sinks comprising material that must
14 first be cooled. United States Patent Nos. 4,250,998 to Taylor, 4,573,581 to Galloway et al., and
15 5,355,684 to Guice are representative of this type of container. This requirement of cooling the heat
16 sink is undesirable because most travelers do not have refrigeration means readily available to them
17 during trips, thus making this type of device unsuitable for long trips.

18 Other carrying devices comprise cryogenic technology. This type of device is wholly
19 inconvenient and generally unavailable to the average consumer.

20 Thus, an unfulfilled need exists for a means to transport insulin for the average traveler. The
21 present invention addresses this need by providing a convenient and inexpensive device suitable for
22 transporting insulin. The heat sink is common ice, a material readily available at gas stations,
23 restaurants, and lodging facilities, and is therefore conveniently replenished as needed by an average
24 traveler.

25 E. BRIEF SUMMARY OF THE INVENTION

26 It is an object of the present invention to provide a device for transporting insulin and other
27 medications requiring refrigeration. It is a further object of the invention to provide consumers an
28 inexpensive and convenient means to keep medications cold during transport by providing a device
29 whose heat sink can be replenished and recharged using means readily available to consumers at
30 hotels and gas stations, namely ice machines and the like.

31 The invention comprises an outer bottle with an outer bottle cap, an inner bottle with an inner
32 bottle cap, an inner cup, fins, and a means to thermally insulate the outer bottle.

33 The outer bottle has a bottom and a side wall, and an open top. An outer bottle cap is
34 provided. The outer bottle cap is adapted to close and temporarily seal the top of the outer bottle so
35 as to make the outer bottle water tight.

36 The inner bottle has a bottom and a side wall, and an open top. The inner bottle is contained
37 within the outer bottle. An inner bottle cap is provided. The inner bottle cap is adapted to close and
38 temporarily seal the top of the inner bottle so as to make the inner bottle water tight.

39 The inner cup is contained within the outer bottle. The inner cup comprises a bottom and a
40 side wall and has an open top. The inner cup is adapted to receive the inner bottle.

41 The fins can be attached to and protruding radially from the side wall of the inner cup. The
42 fins should be of such a width, width being defined as the distance from the inner cup side wall
43 extending radially toward the outer bottle side wall, as to provide support to the inner cup by limiting
44 the movement of the inner cup within the outer bottle. Alternatively, the fins can be attached to the
45 side wall of the outer bottle. In this case, the fins protrude inwardly toward the side wall of the inner
46 cup in a radial pattern. The fins act to keep the inner cup centrally located within and relative to the
47 outer bottle, as well as to keep the inner cup in a substantially upright position within the outer
48 bottle. In use, the inner cup holds the inner bottle. Because the fins act to keep the inner cup
49 centrally located within and relative to the outer bottle, as well as to keep the inner cup in a

50 substantially upright position within the outer bottle, the inner bottle is likewise kept in a
51 substantially upright and centrally located position within the outer bottle.

52 The means to insulate the outer bottle can be a distinct structure such as a thermally insulated
53 soft or hard sided cooler adapted to receive and contain the outer bottle. The means to insulate the
54 outer bottle can also be integral to the structure of the outer bottle itself wherein the bottom and side
55 wall of the outer bottle are constructed of two layers with a gap in between the layers. The gap can
56 contain air or some other suitable thermal insulating material. These materials are well known in the
57 art of thermal insulation, and can comprise liquids, gases, polymeric foam material, natural fiber,
58 and gelatinous heat sink type materials. The gap can also be a vacuum, making the outer bottle a
59 type of vacuum bottle.

60 In use, a user adds ice to the outer bottle, filling with ice spaces defined by the fins, the outer
61 bottle bottom, and the outer bottle side wall. The user places at least one bottle of insulin within the
62 inner bottle and secures the inner bottle cap. The user then secures the outer bottle cap. If the means
63 to insulate the outer bottle is a distinct structure, such as a soft sided cooler, the user places the outer
64 bottle into the means to insulate. The ice functions as a heat sink, and maintains a constant
65 temperature within the device during the gradual phase change of ice into liquid water. A bottle of
66 insulin placed within the inner bottle would then be kept cold during the course of the phase change.

67

68 F. BRIEF DESCRIPTION OF THE DRAWINGS

69 FIG. 1 is a view of the outer bottle and cap.

70 FIG. 2 is a cross-section of the outer bottle and contents, viewed from the top down.

71 FIG. 3 is a longitudinal section of the lid, outer bottle, and contents.

72 FIG. 4 is a partial cross-section showing one possible embodiment of the device showing that
73 the outer bottle may comprise an insulating layer.

74 FIG. 5 is an exterior view of the device as a whole, showing the outer bottle nestled within an
75 outer insulating means.

76 FIG. 6 is a cross section of the device, including the outer insulating means, outer bottle, and
77 contents of the outer bottle.

78 G. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

79 This invention is directed to a travel case for transporting insulin. The device **10** comprises
80 an outer bottle **20** with an outer bottle cap **25**, an inner bottle with an inner bottle cap **35**, an inner
81 cup **30**, fins **40**, and a means to thermally insulate the outer bottle **50**.

82 The outer bottle **20** has a bottom **21** and a side wall **22**, and an open top. An outer bottle cap
83 **25** is provided. The outer bottle cap **25** is adapted to close and temporarily seal the top of the outer
84 bottle **20** so as to make the outer bottle water tight.

85 The inner bottle has a bottom **31** and a side wall **32**, and an open top. The inner bottle is
86 contained within the outer bottle **20**. An inner bottle cap **35** is provided. The inner bottle cap **35** is
87 adapted to close and temporarily seal the top of the inner bottle so as to make the inner bottle water
88 tight.

89 The inner cup **30** is contained within the outer bottle **20**. The inner cup **30** comprises a
90 bottom and a side wall and has an open top. The inner cup is adapted to receive the inner bottle.

91 The fins **40** are attached to and protruding radially from the side wall **32** of the inner cup **30**.
92 The fins **40** should be of such a width, width being defined as the distance from the inner cup side
93 wall **32** extending radially toward the outer bottle side wall **22**, as to provide support to the inner cup
94 **30** by limiting the movement of the inner cup within the outer bottle **20**. The fins **40** act to keep the
95 inner cup **30** centrally located within and relative to the outer bottle **20**, as well as to keep the inner
96 cup in a substantially upright position within the outer bottle. Alternatively, the fins **40** can be
97 attached to and protruding inward from the side wall **22** of the outer bottle **20** toward the inner cup
98 **30**.

99 The means to insulate 50 the outer bottle 20 can be a distinct structure such as a thermally
100 insulated soft or hard sided cooler 53 adapted to receive and contain the outer bottle 20. The means
101 to insulate 50 the outer bottle 20 can also be integral to the structure of the outer bottle wherein the
102 bottom 21 and side wall 22 of the outer bottle are constructed of two layers with a gap 54 between
103 the layers. The gap 54 can contain air or some other suitable thermal insulating material. These
104 materials are well known in the art of thermal insulation, and can comprise liquids, gases, polymeric
105 foam material, natural fiber, and gelatinous heat sink type materials. The gap 54 can also be a
106 vacuum, making the outer bottle a type of vacuum bottle.

107 In use, a user adds ice 60 to the outer bottle 20, filling with ice spaces defined by the fins 40,
108 the outer bottle bottom 21, and the outer bottle side wall 22. The user places at least one bottle of
109 insulin within the inner bottle 30 and secures the inner bottle cap 35. The user then secures the outer
110 bottle cap 25. If the means to insulate 50 the outer bottle 20 is a distinct structure, such as a soft
111 sided cooler 53, the user places the outer bottle 20 into the means to insulate 50, 53. The ice 60
112 functions as a heat sink, and maintains a constant temperature within the device 10 during the
113 gradual phase change of ice into liquid water. A bottle of insulin placed within the inner bottle 30
114 would then be kept cold during the course of the phase change.

115